

## CLAIMS

What is claimed is:

1. A system for induction heating a work piece, wherein the work piece has a first central axis extending longitudinally therethrough, comprising:

an induction heating member having an outer surface and an inner surface, wherein the inner surface defines a void, wherein the void includes a second central axis extending longitudinally therethrough, wherein the first central axis is concentric to the second central axis; and

a fixturing member selectively operable to fix the work piece thereon, wherein the fixturing member is operable to be at least partially received within the void, wherein the fixturing member includes a third central axis extending longitudinally therethrough, wherein the third central axis is eccentric to the first and second central axes; and

a rotation member selectively operable to rotate the fixturing member.

2. The invention according to claim 1, wherein the work piece includes an irregularly shaped outer surface, wherein the outer surface includes a first portion and a spaced and opposed second portion.

3. The invention according to claim 2, wherein the outer surface of the work piece is operable to be received within the void of the induction heating member.

4. The invention according to claim 3, wherein the first and second portions of the work piece are substantially equidistant from the inner surface of the induction heating member.

5. The invention according to claim 3, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

6. The invention according to claim 1, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

7. The invention according to claim 1, wherein the work piece is a cam member.

8. The invention according to claim 1, wherein the work piece includes a heel portion and a spaced and opposed lobe portion.

9. The invention according to claim 1, further comprising a quenching system selectively operable to quench the work piece.

10. A system for induction heating a work piece having an outer surface and an inner surface, wherein the inner surface defines a first void, wherein the first void includes a first central axis extending longitudinally therethrough, comprising:

an induction heating member having an outer surface and an inner surface, wherein the inner surface defines a second void, wherein the second void includes a second central axis extending longitudinally therethrough, wherein the first central axis is concentric to the second central axis;

a fixturing member selectively operable to fix the work piece thereon, wherein the fixturing member is operable to be at least partially received within the second void, wherein the fixturing member includes a third central axis extending longitudinally therethrough, wherein the third central axis is eccentric to the first and second central axes; and

a rotation member selectively operable to rotate the fixturing member;

wherein the outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

11. The invention according to claim 10, wherein the outer surface of the work piece is operable to be received within the void of the induction heating member.

12. The invention according to claim 10, wherein the outer surface of the work piece is irregularly shaped, wherein the outer surface includes a first portion and a spaced and opposed second portion.

13. The invention according to claim 12, wherein the first and second portions of the work piece are substantially equidistant from the inner surface of the induction heating member.

14. The invention according to claim 10, wherein the work piece is a cam member.

15. The invention according to claim 10, wherein the work piece includes a heel portion and a spaced and opposed lobe portion.

16. The invention according to claim 10, further comprising a quenching system selectively operable to quench the work piece.

17. A method for induction heating a work piece, wherein the work piece has a first central axis extending longitudinally therethrough, comprising:

providing an induction heating member having an outer surface and an inner surface, wherein the inner surface defines a void, wherein the void includes a second central axis extending longitudinally therethrough, wherein the first central axis is concentric to the second central axis;

providing a fixturing member selectively operable to fix the work piece thereon, wherein the fixturing member is operable to be at least partially received within the void, wherein the fixturing member includes a third central axis extending longitudinally therethrough, wherein the third central axis is eccentric to the first and second central axes; and

providing a rotation member selectively operable to rotate the fixturing member.

18. The invention according to claim 17, wherein the work piece includes an irregularly shaped outer surface, wherein the outer surface includes a first portion and a spaced and opposed second portion.

19. The invention according to claim 18, wherein the outer surface of the work piece is operable to be received within the void of the induction heating member.

20. The invention according to claim 19, wherein the first and second portions of the work piece are substantially equidistant from the inner surface of the induction heating member.

21. The invention according to claim 19, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

22. The invention according to claim 17, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

23. The invention according to claim 17, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member when the work piece is rotated.

24. The invention according to claim 17, wherein the work piece is a cam member.

25. The invention according to claim 17, wherein the work piece includes a heel portion and a spaced and opposed lobe portion.

26. The invention according to claim 17, further comprising providing a quenching system selectively operable to quench the work piece.

27. The invention according to claim 17, further comprising fixturing the work piece to the fixturing member.

28. The invention according to claim 17, further comprising rotating the work piece.

29. The invention according to claim 17, further comprising induction heating the work piece.

30. The invention according to claim 17, further comprising induction heating the work piece while the work piece is being rotated.

31. A method for induction heating a work piece, wherein the work piece has a first central axis extending longitudinally therethrough, comprising:

providing an induction heating member having an area defining a void, wherein the void includes a second central axis extending longitudinally therethrough, wherein the first central axis is concentric to the second central axis;

providing a fixturing member selectively operable to fix the work piece thereon, wherein the fixturing member is operable to be at least partially received within the void, wherein the fixturing member includes a third central axis extending longitudinally therethrough, wherein the third central axis is eccentric to the first and second central axes; and

providing a rotation member selectively operable to rotate the fixturing member.

32. The invention according to claim 31, wherein the work piece includes an irregularly shaped outer surface, wherein the outer surface includes a first portion and a spaced and opposed second portion.

33. The invention according to claim 32, wherein the outer surface of the work piece is operable to be received within the void of the induction heating member.

34. The invention according to claim 33, wherein the first and second portions of the work piece are substantially equidistant from a surface of the void of the induction heating member.



35. The invention according to claim 33, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

36. The invention according to claim 31, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member.

37. The invention according to claim 31, wherein an outer surface of the work piece is operable to be substantially evenly heated by the induction heating member when the work piece is rotated.

38. The invention according to claim 31, wherein the work piece is a cam member.

39. The invention according to claim 31, wherein the work piece includes a heel portion and a spaced and opposed lobe portion.

40. The invention according to claim 31, further comprising providing a quenching system selectively operable to quench the work piece.

41. The invention according to claim 31, further comprising fixturing the work piece to the fixturing member.

42. The invention according to claim 31, further comprising rotating the work piece.

43. The invention according to claim 31, further comprising induction heating the work piece.

44. The invention according to claim 31, further comprising induction heating the work piece while the work piece is being rotated.